

WHAT IS CLAIMED IS:

1. A fabrication method of a semiconductor integrated circuit device, comprising the steps of:

(a) a step of forming a first insulation film on a main surface of a semiconductor substrate;

(b) a step of forming an interconnect opening in said first insulation film;

(c) a step of depositing a first conductor film for interconnect formation and a second conductor film based on copper for interconnect formation in that order on said first insulation film including an inside of said interconnect opening;

(d) a polishing process of polishing said first and second conductor films for interconnect formation thereby forming an interconnect in said interconnect opening;

(e) a process of carrying out a cleaning process on the semiconductor substrate after said polishing process;

(f) a process of carrying out a plasma process in a hydrogen atmosphere on the substrate after said cleaning process;

(g) a process of carrying out a plasma process in an ammonia atmosphere on the substrate after said cleaning process; and

(h) a process of depositing a second insulation film on said first insulation film and interconnect after said hydrogen gas plasma and ammonia gas plasma processes.